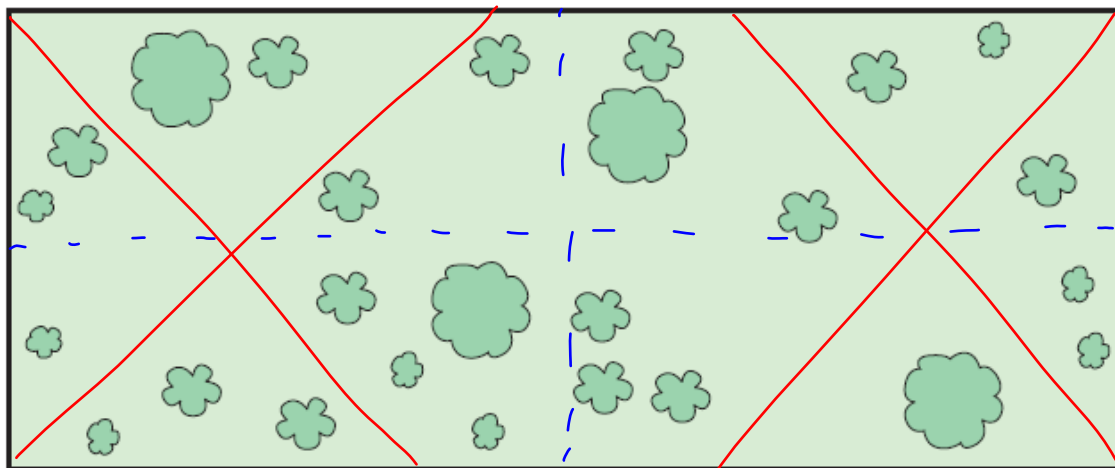


Geometry Date \_\_\_\_\_ 1.5 Notes  
Segment and Angle Bisectors (pp 34-38)

Warm-Up Problem:



- A. Members of the city council want to build a sidewalk through the middle of the park. They decide this sidewalk should not go through the park diagonally. What do you think it means to build a sidewalk through the middle of the park? Draw a sidewalk on the diagram above that meets these conditions.
- B. After the first sidewalk is built, they decide to build four more sidewalks, one at each of the four corners of the park. They want each corner sidewalk to divide the angle at the corner in half. Draw a sidewalk at each corner in the diagram above that meets these conditions.
- C. Do any of the sidewalks you drew in Questions A & B intersect?
- D. Compare your diagram with the diagrams your classmates drew. How are your diagrams the same? How are they different?

point that divides a segment in half. *Midpoint:* Each segment is  $\approx$  to the other. Each segment is  $\frac{1}{2}$  the whole

the line that passes through the midpoint *Bisector:*

Midpoint Formula:

$$\left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

1. **Example:** Find the midpoint of  $\overline{DE}$  with endpoints D(3, 5) and E(-4, 0).

$$\left( \frac{3 + (-4)}{2}, \frac{5 + 0}{2} \right) = \left( \frac{-1}{2}, \frac{5}{2} \right)$$

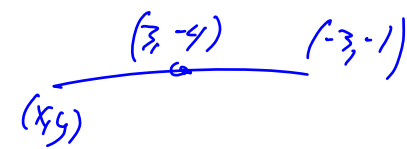
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2. Guided Practice: Find the midpoint of  $\overline{XY}$  with endpoints  $X(3, -4)$  and  $Y(-3, -1)$ .

$$(0, -2.5)$$

3. Example: The midpoint of  $\overline{XY}$  is  $M(3, -4)$ . One endpoint is  $Y(-3, -1)$ . Find the coordinates of the other endpoint.

$$\begin{array}{l} X(x, y) \quad M(3, -4) \quad Y(-3, -1) \\ \frac{x + (-3)}{2} = 3 \quad \frac{y + (-1)}{2} = -4 \\ x - 3 = 6 \quad y - 1 = -8 \\ x = 9 \quad y = -7 \end{array}$$

  
 $(9, -7)$

4. Guided Practice: The midpoint of  $\overline{JK}$  is  $M\left(0, \frac{1}{2}\right)$ . One endpoint is  $J(2, -2)$ . Find the coordinates of the other endpoint.

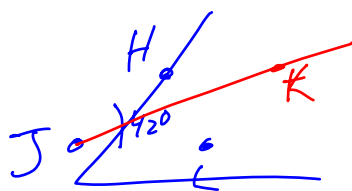
$$\begin{array}{l} K(-2, 3) \\ \frac{-2 + y}{2} = \frac{1}{2} \end{array}$$

Angle Bisector:

Line that cuts an angle is half.  
Each angle formed is  $\frac{1}{2}$  the original angle &  $\cong$  to each other.

Examples

5.  $\overline{JK}$  bisects  $\angle HJL$ . Given that  $m\angle HJL = 42^\circ$ , what are the measures of  $\angle HJK$  &  $\angle KJL$ ?

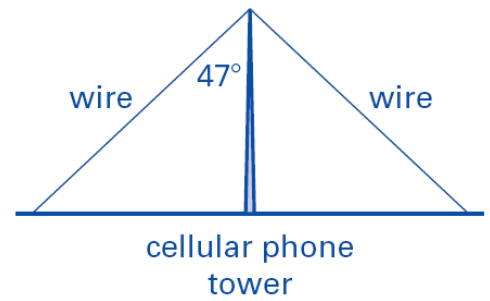


$$\begin{array}{l} m\angle HJK = 21^\circ \\ m\angle KJL = 21^\circ \\ m \end{array}$$

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6. A cellular phone tower bisects the angle formed by the two wires that support it. Find the measure of the angle formed by the two wires.

94°



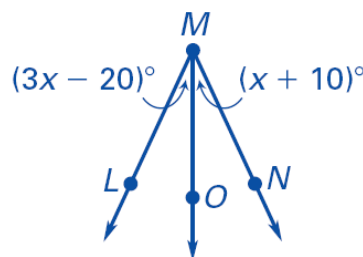
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7. In the diagram  $\overline{MO}$  bisects  $\angle LMN$ . The measures of the two congruent angles are  $(3x - 20)^\circ$  &  $(x + 10)^\circ$ . Solve for  $x$ .

$$3x - 20 = x + 10$$

$$2x = 30$$

$$x = 15$$



**Guided Practice.**

8. In the diagram  $\overline{BD}$  bisects  $\angle ABC$ . Find  $x$  and use it to find  $m\angle ABD$ ,  $m\angle DBC$ , &  $m\angle ABC$ .

$$2x + 50 = 5x + 5$$

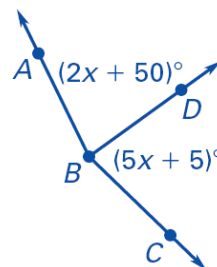
$$45 = 3x$$

$$x = 15$$

$$m\angle ABD = 80^\circ$$

$$m\angle DBC = 80^\circ$$

$$m\angle ABC = 160^\circ$$



9. What kind of geometric figure is an *angle bisector*?

Ray.

10. How do you indicate congruent segments in a diagram? How do you indicate congruent angles in a diagram?

Tick marks.

11. What is the simplified form of the Midpoint Formula if one of the endpoints of a segment is  $(0, 0)$  and the other is  $(x, y)$ ?

$$\left( \frac{x}{2}, \frac{y}{2} \right)$$